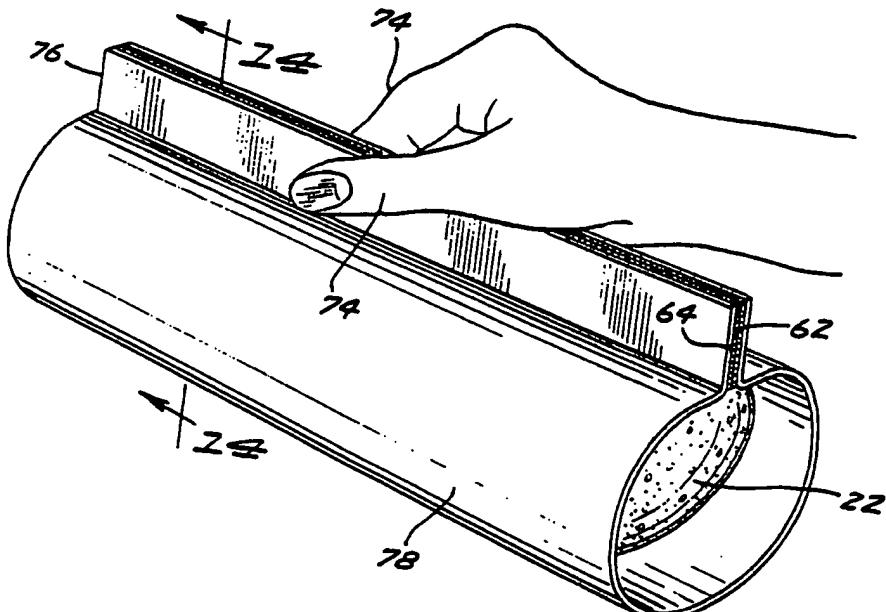




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : H05B 6/64		A1	(11) International Publication Number: WO 91/07861 (43) International Publication Date: 30 May 1991 (30.05.91)
(21) International Application Number: PCT/US90/06867 (22) International Filing Date: 21 November 1990 (21.11.90)		(74) Agents: O'TOOLE, John, A. et al.; Peterson, Wicks, Nemmer & Kamrath, 1407 Soo Line Building, 105 South Fifth Street, Minneapolis, MN 55402 (US).	
(30) Priority data: 440,068 22 November 1989 (22.11.89) US		(81) Designated States: AT, AT (European patent), AU, BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI patent), BR, CA, CF (OAPI patent), CG (OAPI patent), CH, CH (European patent), CM (OAPI patent), DE, DE (European patent), DK, DK (European patent), ES, ES (European patent), FI, FR (European patent), GA (OAPI patent), GB, GB (European patent), GR (European patent), HU, IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MC, MG, ML (OAPI patent), MR (OAPI patent), MW, NL, NL (European patent), NO, RO, SD, SE, SE (European patent), SN (OAPI patent), SU, TD (OAPI patent), TG (OAPI patent), US.	
(60) Parent Application or Grant (63) Related by Continuation US Filed on 22 November 1989 (22.11.89)		(71) Applicant (for all designated States except US): GENERAL MILLS, INC. [US/US]; Number One General Mills Boulevard, P.O. Box 1113, Minneapolis, MN 55440 (US).	
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(54) Title: MICROWAVE BREAD ARTICLE AND METHOD



(57) Abstract

A bread article (22), composed of specially chosen ingredients and quantities thereof, is substantially pre-baked at the bakery for subsequent microwave refreshening by the consumer. Several embodiments of wrappers (24, 70, 100, 114) containing appropriately located susceptor material (46, 80, 92) therein are disclosed, a preferred one of which is sold with the pre-baked bread (22) and used by the consumer in achieving the microwave browning and crispening of the product (22).

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1 MICROWAVE BREAD ARTICLE AND METHOD

Cross-reference to Related Application

5 A commonly assigned co-pending application titled "MICROWAVE BREAD AND METHOD OF PREPARATION," Serial No. 07/448,048, filed in the name of Albert L. Saari et al. on December 8, 1989, contains subject matter related to this application and which subject matter is incorporated herein by reference.

Background of the Invention

10 1. Field of the Invention

This invention relates generally to the browning and/or crisping of a food article utilizing microwaves, and pertains more particularly to the browning and crisping of a loaf of bread that has been substantially 15 pre-baked in a conventional oven.

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1 2. Description of the Prior Art

It has long been known that microwaves, while highly effective in cooking certain food items, have the notable shortcoming of not being able to crisp and brown most 5 food products. This inadequacy has been recognized in U.S. Patent 4,267,420 granted on May 12, 1981 to William A. Brastad for "PACKAGED FOOD ITEM AND METHOD FOR ACHIEVING MICROWAVE BROWNING THEREOF." While the method disclosed in the Brastad patent has performed well for 10 its intended purpose, the procedure does not lend itself readily to the browning and crisping of a bread product in that the composition of the bread product should be correlated with the encompassing wrapping material which includes a microwave interactive or susceptor layer. In 15 particular, when a bread article is microwave heated, initially the bread is first warmed and both the crust and crumb interior soften, but upon further heating, the crumb texture quickly dries and becomes extremely tough. Hence, the need for the above mentioned correlation has 20 continued to persist. Also, the browning of a pre-cooked loaf of bread requires a certain amount of venting in order to permit the escape of moisture or vapors that otherwise would be confined.

Another microwave sleeve/food item combination article 25 is known and sold under the trademark "Lean Pockets." The article comprises a rounded, bar-shaped food in the form a bread shell with a sauce filling, e.g., pizza sauce with cheese, mushrooms, etc. The microwave sleeve comprises metallized upper and lower rounded major panels 30 attached along longitudinally extending side gusset panels. The panels comprise a metallized film mounted on relatively inflexible paperboard. Due to the uniformity of the bar-shaped food and the design of the surrounding microwave sleeve, good conformity between the sleeve and 35 the food item is achieved. However, the contact between the sleeve and the bread exterior is extensive only on the bottom surface. Moreover, the product comprises a

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1 filled bread item. Such items, owing to the relatively high moisture content of the filling, are more tolerant to extensive microwave heating due to the moisture contribution from the filling.

5 An attempt to crisp and brown an unfilled bread product is disclosed in U.S. Patent 4,775,771 issued on October 4, 1988 to Thomas D. Pawlowski et al for "SLEEVE FOR CRISPING AND BROWNING OF FOODS IN A MICROWAVE OVEN AND PACKAGE AND METHOD UTILIZING SAME." However, the 10 paperboard sleeve referred to in this particular patent fails to conform fully to the shape of the bread product in that it comprises a plurality of relatively rigid panels which are articulated along longitudinal fold lines in order to form a polygonal tube. More 15 specifically, the patented sleeve does not accommodate variations in product size circumference. Therefore, uniform browning and crispness would not be achieved in a situation where portions of the sleeve (especially at its fold lines) do not physically contact the product being 20 microwaved.

Hence, a need still exists for a method and means for achieving a uniform browning and crispness of a food item, particularly a loaf of bread that has been pre-baked to a desired degree to provide a significant browning thereof 25 so that a desired amount of crust browning and recrispening or regeneration of a dual textured product, that is, a crisp crust and soft interior, can be realized when the consumer places the pre-baked product in a microwave oven when contained in a flexible wrapper 30 capable of browning and recrispening the bread crust by virtue of closely conforming to the loaf's specific shape and physical size. In this regard, it should be understood that the crust of the pre-baked bread softens over a relatively short period of time due to the 35 moisture migration that occurs, and that the resulting loss of crispness should be restored.

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Summary of the Invention

Modern-day living has encouraged the widespread use of convenience foods. A number of such foods lend themselves readily to being heated or cooked in a 5 microwave oven. However, fully cooked breads that are available in grocery stores and bakeries do not lend themselves readily to being heated in a microwave oven. Instead of enhancing the quality of the purchased bread, the quality is diminished, frequently to the extent that 10 the bread's crust becomes soft and its interior tough and/or dry. It is an object of the present invention to provide a food item, particularly a loaf of bread, that is fully or substantially baked and fully or partially browned, whereby when placed in a microwave oven and 15 utilizing the teachings of the present invention will result in a highly tasty and attractive loaf of bread, actually resembling a loaf of homemade bread as far as its texture and appearance are concerned. Thus, an aim of the invention is to enable a consumer to purchase a 20 loaf of bread that will be improved upon when appropriately wrapped with susceptor material in accordance with my invention.

Another object of the invention is to provide flexible sheet material that will contact the item of food to be 25 browned and/or crispened over a large portion of its surface so that an appealing bread product results. In this regard, it is contemplated that the susceptor material include a metallized polymer film either sandwiched between two layers of paper (triplex 30 structure) or laminated to a single layer (duplex structure) so as to provide a better dispersion of the heat that is converted from microwave energy to thermal energy. To achieve such results, the food item is retained in a somewhat compressed state within a flexible 35 sleeve containing the susceptor material.

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1 Another object is to provide wrapping material that
the consumer can easily make use of in achieving the
browning and/or crispening without having to follow
detailed instructions. Also, an aim of the invention is
5 to provide wrapping material that will achieve the
desired amount of browning and crispening, which material
will be inexpensive and which can be discarded after but
a single use.

Still further, a specific object of the invention is
10 to provide a combination of a bread loaf and a sheet of
material that will effect an optimum browning and which
cannot only be easily handled in preparing the combined
loaf and microwave interactive material prior to the
combination being placed in a microwave oven but which
15 will enable the consumer to handle more readily the
heated combination when removing the combination from the
microwave oven.

Yet another object of the invention is to provide a
food product that can be made ready for consumption in a
20 matter of only several minutes after being placed in a
microwave oven, thereby appealing to those who must
quickly provide meals because of their occupations and
working schedules.

A further object of the invention is to provide a
25 wrapping material that will better vent whatever vapors
are generated during the microwaving of a bread product,
not only providing open ends that readily allow vapors to
escape but also offering avenues of escape in between the
two open ends.

30 Also, the invention has for an object the
accommodation of various sizes and types of bread
articles to be microwaved which require a crisp exterior
and a soft interior, the consumer compressively wrapping
the article so that good surface contact exists between
35 the microwaving material and the article.

Another object is to provide wrapping material for
microwaving a loaf of bread that has been pre-baked, the

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- 1 material being readily shipped in bulk in a flat condition to the baker, who pre-bakes the bread, and thereafter has the choice of unwrapping the bread at the bakery or delivering the wrapping material to the retail store
- 5 along with the pre-baked bread so that the consumer can then combine the two immediately prior to reheating the bread in a microwave oven.

Another object of the invention is to specifically correlate the ingredients constituting a bread product 10 with the surrounding microwave interactive or susceptor material so that a dual texture is achieved providing both a crisp crust and a soft, moist interior.

Still another object is to provide a bread product that has a relatively long shelf life, one considerably 15 longer than breads now sold in stores and bakeries, so that it does not reach a stale state in which it must either be sold at a reduced price or discarded. More specifically, it is within the purview of the invention to achieve a shelf life of from one to two weeks, whereas 20 ordinary bread normally starts deteriorating within a matter of hours and becomes stale in two or three days, a period then rendering the bread unsalable.

Briefly, my invention envisages the substantial baking of a bread article in a bakery. Owing to the 25 employment of properly selected ingredients and quantities thereof in the baked bread, a desired moisture and texture is retained in the bread which makes the bread especially suited for subsequent microwaving. Various wrapper and sleeve configurations are presented which will assure an 30 excellent result as far as the appearance and taste of the bread product after the microwaving thereof has been completed. Due to the fact that the bread is pre-baked, only a short interval of time is needed to complete the recrispening and browning process in a conventional 35 microwave oven so that the bread can be served after an interval of only a few minutes.

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1 Brief Description of the Drawings

Figure 1 is a perspective view of a fragmentarily depicted microwave oven when being used to practice my invention;

5 Figure 2 is a plan view of a blank of wrapping material used to encompass a loaf of bread, the combination of the wrapping material and bread having been shown in Figure 1;

10 Figure 3 is a perspective view of the wrapper of Figure 1 in the process of being preformed into a sleeve;

15 Figure 4 is a perspective view of the completed sleeve;

Figure 5 is a perspective view of the loaf of bread of Figure 1 and the encompassing sleeve which compressively engages the bread, the view being considerably enlarged;

20 Figure 6 is a sectional view taken in the direction of line 6-6 of Figure 5;

Figure 7 is a sectional view taken in the direction of line 7-7 of Figure 5;

25 Figure 8 is a greatly enlarged sectional detail taken in the direction of line 8-8 of Figure 2 for the purpose of showing the laminated construction of the wrapper or sleeve material utilized in encompassing the loaf of bread as illustrated in Figures 1 and 5, the wrapper material in this instance involving two layers of paper;

Figure 9 is a view generally similar to Figure 8, but depicting only one layer of paper;

Figure 10 is a plan view of a modified blank illustrating the invention;

30 Figure 11 is a sectional view of the sleeve formed with the blank of Figure 10;

Figure 12 is a sectional view with the bread inserted;

35 Figure 13 illustrates the consumer manually pressing together two adhesive strips which take up any unwanted clearance between the bread and the surrounding wrapper sleeve;

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- 1 Figure 14 is a sectional view taken in the direction of line 14-14 of Figure 13, the view showing the virtual complete contact between the wrapping material and the loaf of bread;
- 5 Figure 15 is a sectional view corresponding to Figure 14 but with the combination inverted for placement in a microwave oven, the orientation corresponding to that of Figure 7;
- 10 Figure 16 is a plan view of still another blank;
- 10 Figure 17 is a perspective view of the sleeve resulting from the blank appearing in Figure 16;
- 10 Figure 18 is a sectional view corresponding to Figure 7 but illustrating the sleeve of Figure 17 with a loaf of bread contained therein;
- 15 Figure 19 represents a preferred form of blank that can be used in realizing the benefits of my invention;
- 15 Figure 20 is a perspective view illustrating the blank of Figure 9 being rolled about a loaf of bread, the two adhesive strips not yet having been engaged;
- 20 Figure 21 is a perspective view taken in the same direction as Figure 20 but with the sealing of the wrapping material completed;
- 20 Figure 22 is a sectional view taken in the direction of line 22-22; and
- 25 Figure 23 is a sectional view corresponding to Figure 22 but with the wrapped bread inverted and thus oriented in the position in which it is placed in a microwave oven.

Description of the Preferred Embodiments

- 30 Referring first to Figure 1, it will be perceived that a conventional microwave oven 10 has been fragmentarily depicted, having a floor or bottom 12, a hinged door 14 and appropriate controls at 16.
- 35 Placed on the floor 12 is a combination 20 comprised of a loaf of bread 22 having a flexible wrapper 24 encompassing the loaf of bread 22, the wrapper 24 constituting a sleeve open at its opposite ends 26 and 28.

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1 The flexible wrapper or sleeve 24 is fabricated from
a blank denoted generally by the reference numeral 30 in
Figure 2. From Figure 2 it will be discerned that a
first plurality of discontinuous cohesive regions, either
5 of regular or irregular shape (in contradistinction to
bands, bars or strips of a continuous nature), are
employed, being exemplified as a group of spaced adhesive
spots or disks 32 that are marginally located adjacent
the upper edge of the blank 30 as viewed in Figure 2,
10 whereas a similar series of cohesive spots or disks 34
extend throughout the lower marginal portion of the
blank 30. The illustrative series of disks 32 have
spaces 36 therebetween for a purpose yet to be explained,
and the disks 34 have similar spaces 38 therebetween. It
15 will be appreciated that the disks 32, 34 are preferably
formed from a cohesive material, the cohesive property
having just been referred to, in that a cohesive material
adheres only to itself in contrast to an adhesive
material which adheres to other materials. Additionally,
20 the selected cohesive material should require only a low
pressure contact, such as that produced by finger
pressure. Still further, it is preferred that the
cohesive material operate at room temperature.

From Figure 3 it can be seen that the blank 30 is
25 folded so as to cause the disk 34 to contact the disk 32
to provide a fin 40 as can be appreciated from Figure 4.
Thus, the completed flexible wrapper or sleeve 24 has a
bore or passage 42 extending therethrough. The loaf of
bread 22 is contained within the bore 42 as can be
30 appreciated from an inspection of either Figure 1 or
Figure 5.

The laminated or sandwich construction of the blank
30 involving the previously mentioned triplex structure
can be understood from Figure 8 which is a greatly
35 enlarged sectional detail taken in the direction of line
8-8 of Figure 2. From Figure 8 it can be seen that the
blank 30 includes a film 44 of resinous plastic such as

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1 polyester having a thin coating or layer of microwave
interactive material constituting a susceptor 46, the
function of which is to convert some of the microwave
energy into thermal energy to provide the browning and
5 crispening heat for the loaf of bread 22 which, as
already pointed out, has been for all intents and
purposes fully baked in a conventional oven normally used
by bakeries.

The polyester film 44 and the metallized coating
10 constituting the susceptor 46 are sandwiched between two
layers of paper 48 and 50 in the embodiment depicted in
Figure 8. Adhesive labeled 52 in Figure 8 secures the
layer of paper 48 to the upper surface of the film 44,
whereas adhesive indicated by the numeral 54 secures the
15 layer of paper 50 to the metallized coating or susceptor 46.

From Figure 8 it will be observed that the coating 46
on the film 44 does not extend all the way to the right.
The reason for this is that there should be little or no
heat generated in the region where the disks 32 and 34 are
20 located. Dashed lines 56 and 58 superimposed on Figure 2
indicate the region therebetween that is occupied by the
material constituting the susceptor 46. The line 58 near
the bottom of Figure 2 also appears on Figure 8.

Although Figure 8 represents the preferred
25 construction of the blank 30 in that two layers of paper
48, 50 are made use of, providing a somewhat better
distribution or dispersion of the heat converted by the
susceptor 46, it is possible to use the laminated blank
30a appearing in Figure 9 where only one layer of paper
30 50a has been employed. Thus, in Figure 8, it will be
understood that the cohesive disks 34 (only one of which
appears in Figure 8) have been placed on the layer of
paper 48, whereas in Figure 9 the disks 34a (only one of
which appears in Figure 9) have been applied directly to
35 the polyester film 44a. The paper 50a is secured to the
film 44a by adhesive 54a. What is important, whether one
or two layers of paper are used, is that the mass of

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1 either the duplex embodiment (Figure 9) or the triplex embodiment (Figure 8) possesses the proper amount of mass.

It will be appreciated that the flexible wrapper 24 is preformed by bringing the cohesive disks 32 and 34 (or 5 whatever discontinuous cohesion regions are selected)

into contact with each other. It is planned that the circumference of the completed wrapper or sleeve 24 be somewhat less than the circumference of the bread loaf 22.

Owing to the compressibility of the bread loaf 22, the 10 loaf 22 can be gently forced or squeezed into the sleeve 24 to provide good surface contact between the sleeve 24 and the loaf 22.

It will be recalled that the separation of the disks 32 and 34 form spaces 36 and 38 therebetween.

The purpose of the spaces 36 and 38 is to allow some of 15 the vapors generated during the microwaving of the combination 20 to escape more completely. Of course, the open ends 26 and 28 permit the greater proportion of

vapors to escape via these open ends. However, inasmuch as the spaces 36 and 38 exist throughout the length of 20 the bread 22, a more complete riddance of the vapors is accomplished, together with a concomitant better browning and crisping of the bread 22.

It is important that the wrapper or sleeve 24 conform closely to the shape of the bread 22 and that a

25 compressive contact exist between the wrapper or sleeve 24 and the bread 22 it encompasses, such as by having the sleeve circumference be somewhat less than that of the loaf 22. Inasmuch as the wrapper or sleeve 24 appearing in Figures 1-7 is prefabricated to provide the sleeve

30 configuration having the bore or passage 42 for receiving therein the bread 22, care should be exercised that the loaf of bread 22 be sized at the bakery so that it fits snuggly into the wrapper or sleeve 24 when the consumer is ready to reheat the bread 22. In this regard, it is 35 planned that the loaf of bread 22 be marketed in a package along with the wrapper 24; the wrapper 24, when being marketed with the bread 22, can assume the

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1 relatively flat configuration in which it appears in
Figure 4.

Not only is it desired that the bread 22 possess a browned and crisped crust, it is desirable that the
5 interior of the bread possess a soft and tender texture. The composition of the bread 22 is specially formulated and adapted for reheating with the material selected for the wrapper or sleeve 24 in order to provide a bread article exhibiting resistance to crumb toughening upon
10 extended microwave heating. It can be explained that the susceptor 46 will allow a majority of the microwave energy to be transmitted therethrough, absorbing the remaining minority which is converted into thermal energy that produces the browning and crisping of the bread 22.
15 Consequently, it is important that the composition of the bread 22 be correlated with the material of the wrapper or sleeve 24 so that the microwaving produces a soft and tender interior bread texture.

Briefly, the bread formulation can comprise a
20 preformed emulsion of water, a dough conditioner(s) and a pregelatinized farinaceous material. The function of the emulsifier is to hold and retain a sufficient amount of moisture in the pre-baked bread 22 to prevent the bread from becoming dry and tough. The composition of the
25 bread 22 and its method of preparation are set forth in detail in the previously identified co-pending application, Serial No. 07/448,048. From a reading of the co-pending application, a specific emulsion is described, and in the most preferred embodiments, care should be exercised when
30 practicing the present invention to adopt such a bread composition so that the bread 22 will lend itself readily to being refreshed in a microwave oven. Once again, the bread 22 is substantially baked prior to the consumer placing such bread 22 in a microwave oven. However, the
35 baking process can be terminated before any significant browning or crisping takes place, the browning and crisping, as well as the heating of the interior of the

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1 bread 22, being achieved when the bread 22 is placed in a
microwave oven by the consumer.

5 All that the consumer need do is to heat the
combination 20 for approximately 2½ to four minutes
10 5 (depending on the rating of the microwave oven) in order
to produce a loaf of bread 22 having an attractive
appearance and also one that is tasty and which simulates
homemade bread that would require a considerable amount
of time and effort to prepare, time and effort that is
normally not available in modern day households.

Surprisingly, the present refreshened bread is actually
preferred by many to warm, freshly baked bread prepared by
conventional baking.

Inasmuch as close contact or engagement is highly
15 desirable between the wrapper 24 and the bread 22, it
should be recognized that the bakers will need to
correlate the size of the bread 22 with a preformed
wrapper 24, such as that described in Figures 1-7. With
this in mind, attention is directed to Figure 10 where a
20 somewhat modified blank 60 is set forth. In this
instance, instead of the cohesive disks 32 and 34,
continuous strips 62 and 64, preferably of an adhesive
material, are employed, these strips 62, 64 residing
along the opposite marginal edges of the blank 60. As
25 with the disks 32 and 34, the two strips 62, 64 will
adhere to each other when subjected to a sufficient
amount of heat. Thus, the material selected for the
strips 62, 64 is what is normally referred to as a
hot-melt adhesive. However, inwardly flanking the strips
30 62, 64 are additional "cold" cohesive strips 66, 68 that
remain unsecured until pressed together. In other words,
the strips 62, 64 will be permanently adhered together at
the time of fabrication. On the other hand, the strips
66, 68 remain unadhered to each other until the consumer
35 presses them together as pictured in Figure 13.

Perhaps it will be helpful, though, to refer now to
Figure 11 where the preformed wrapper or sleeve labeled 70

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1 has been illustrated. It should be noted that the strips
62, 64 are in physical engagement, whereas the strips 66,
68 are not. Figure 12 shows the bread 22 actually
inserted in the bore or passage of the sleeve 70.
5 However, it will be noted that a slight amount of space
or clearance 72 exists between the loaf of bread 22 and
the wrapping material constituting the sleeve 70.
However, the provision of the "cold" cohesive strips 66,
68 enables the consumer to simply draw his or her fingers
1074 along the fin 76 formed by the already existing
adherence of the hot-melt adhesive strips 62, 64 together
so as to cause the "cold" cohesive strips 66, 68 to take
up whatever clearance 72 exists. This causes the wrapper
70 to be drawn tightly about the entire circumference of
15the bread loaf 22; such a result can be readily
comprehended from Figure 14. In other words, whatever
clearance 72 exists is taken up by simply pressing the
two strips 66, 68 together, thereby producing a
compressive contact between the wrapper or sleeve 70 and
20the bread loaf 22 contained therein.

In the preferred method of use, best results are
obtained when the wrapper 70 and bread 22 combination of
Figure 14, which combination has been indicated by the
reference numeral 78, is placed in the microwave oven,
25the fin 76 is flexed somewhat tangentially and the
combination 78 inverted to the position illustrated in
Figure 15 so that the fin 76 underlies the bottom of the
bread loaf 22. Of course, it will be understood that the
laminated construction of the wrapper or sleeve 70 can be
30the same as in Figure 8, and alternatively (although not
to the same degree of preference) to that illustrated in
Figure 9. Also, it will be appreciated that satisfactory
results can be obtained when the fin 76 is not positioned
beneath the bread, or that even the bottom of the bread
35loaf is uppermost.

As with the blank 30 it is important that the
susceptor 80 for the blank 60 not overlie either of the

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1 adhesive strips 62 or 64 or either of the cohesive strips
66 or 68. Hence, as far as the blank 60 depicted in
Figure 10 is concerned, the susceptor 80 extends only
between the horizontal lines 82, 84, the marginal
5 portions in which the strips 62, 64, 66 and 68 reside
being devoid of susceptor material. Stated somewhat
differently, the relation of the width of the susceptor
80, as in all of the herein described embodiments, should
correspond substantially to the circumference of the loaf
10 22. Thus, for a so-called "pup" loaf having an average
circumference of 200 mm, the susceptor would have a width
of 200 ± 15 mm.

Whereas the two embodiments that have now been
described herein can be considered to involve a fin-type
15 adhesive seal (including the fins 40 and 76), it is
possible to utilize a lap seal. With this in mind, the
blank 86 of Figure 16 has been presented. In this
instance, there is a cohesive strip 88 on one side of the
blank 86 and another cohesive strip 90 on the opposite
20 side. The susceptor or microwave interactive material 92
in this instance extends between the two lines indicated
by the reference numerals 94, 96. The fabrication of the
blank 86, as far as the paper layers are concerned, can
be identical to the paper layers 48, 50 of Figure 8, or
25 in the alternative to the single layer 50 illustrated in
Figure 9.

Figure 17 shows the blank 86 of Figure 16 being
folded so as to cause the adhesive strips 88, 90 to
overlap each other, resulting in the combination 98
30 appearing in Figure 18.

In this instance, the cohesive strips 88, 90 can in
one variation be of the so-called hot-melt type of
adhesive which would be fabricated to produce a preformed
sleeve 100. On the other hand, in another variation the
35 strips 88, 90 can be of the so-called "cold" type of
cohesive which would then allow them to be pressed
together by the consumer when the bread 22 is to be

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1 microwaved. The advantage of having the consumer secure
the cohesive strips 88, 90 together is that the bread 22
can be more tightly wrapped and compressed with the blank
86 to form the sleeve 100 so that the loaf 22 need not be
5 baked to a predetermined size in order to fit snuggly
within a preformed sleeve.

A modification of the wrapper or sleeve 100
pictorially appearing in Figures 16-18 and representing
the best mode of practicing the invention is presented in
10 Figures 19-23. It will be noted that the blank 102 set
forth in Figure 19 includes two cohesive strips 104 and
106 corresponding to the two strips 88 and 90 in Figures
16 and 17. However, in this instance, the strip 104 is
marginally inset so as to provide a fin 108 free of
15 cohesive material that facilitates the handling of the
bread and wrapper combination denoted in this instance by
the reference numeral 110.

In this situation, Figure 20 shows the bread 22 being
wrapped, but with the cohesive strips 104 and 106 not yet
20 engaged with each other. This procedure would be
practiced by the consumer. What results is the provision
of the fin 108 that projects upwardly as viewed in Figure
21. The cross section shown in Figure 22 illustrates the
conformity of the wrapper or sleeve 114 of the combination
25 110 to the shape of the bread loaf 22, actually
compressing the bread 22 somewhat and concomitantly
providing good contact between the sleeve 114 and the
bread 22 contained therein. Of course, the orientation
of the combination 110 is preferably inverted, as shown
30 in Figure 23, when the combination 110 is to be placed in
a microwave oven.

Although it is intended that the wrapping procedure
involved in Figures 19-23 be practiced by the consumer
just prior to the placement of the combination 110 in a
35 microwave oven, it will be appreciated that the adhesive
strips 104, 106 can be of the hot-melt variety and that
the sleeve 114 be preformed and marketed along with the

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1 loaf of pre-baked bread 22 baked by the bakery. In such a situation, the circumference of the bread loaf 22 should be correlated with the diameter of the passage or bore extending through the sleeve 114 when preformed, the 5 preferred relation being that the diameter be from 90 to 110% of the circumference.

Whether the wrapper or sleeve 114 of Figures 19-23 is either preformed or formed by the consumer, it will be appreciated that the fin 108 not only enables the 10 combination 110 to be handled more readily when placing the combination in a microwave oven, but greatly facilitates its removal, for the orientation of the combination 110 as depicted in Figure 23 can be rolled over in the oven so that the fin 108 is again uppermost 15 (as it is in Figure 22) so that the consumer can readily grasp the fin 108 and remove the now browned and crispened loaf, even though quite hot.

In general, and this applies to all of the embodiments described herein, the loaf 22 should be 20 compressed within its sleeve, whether the sleeve is preformed or formed by the consumer. In this way, good contact is established between the sleeve and the loaf, resulting in an enhanced browning and crispening in the microwave oven 10.

25 Recapitulating, it should be borne in mind that the various loaves of bread 22 are virtually completely baked at the bakery. Normally, this will be for a period of about 20 to 21 minutes at a temperature on the order of 425°F, as explained in said co-pending application. As 30 far as the period for heating the bread in a microwave oven, such a period is on the order of 2½ to four minutes. Depending on the type of microwave oven, the bread may require that it be shifted or repositioned within the microwave oven perhaps midway during the 35 relatively short microwaving period, although the reorientation may not be needed if the microwave oven is equipped with an effective stirrer or carrousel.

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1 The refreshed loaf from experience always possesses an exceedingly attractive outer appearance, the crust being both crisp and browned. Also, the interior of the loaf constitutes a soft and chewy crumb texture, simulating
5 that of homemade bread.

Inasmuch as the shelf life of the unbrowned bread as baked by the bakery is from one to two weeks, the microwavability of such a bread article when utilizing the teachings of the present invention results in a
10 highly marketable item in that the store merchandising a combination of a susceptor-containing wrapper and unbrowned loaf of bread need not be concerned, not at least to the extent now required, with the bread becoming stale. The consumer is satisfied because he or she
15 obtains an aesthetically pleasing loaf of bread, having an optimum degree of browning, together with a very palatable, interior texture, all of which is realized in just a few minutes and with a minimum of effort.

Not only is a superior bread product realized, but
20 the cost of producing such a product is minimal in that the susceptor-containing wrapper can be fabricated at a comparatively low cost, thereby enabling the combination of an unbrowned loaf of bread and the wrapper therefor to be competitively sold with breads currently being
25 marketed. Because of the longer shelf life, the unbrowned bread will possess considerable appeal to grocery stores in that grocery stores are not confronted with the possibility of the bread becoming stale, at least as rapidly as with the types of breads presently
30 being sold.

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CLAIMS

1. A sleeve for tightly and conformably enclosing a food article of a compressible nature to be heated in a microwave oven to obtain a crispy exterior, with the food article having an exterior surface, an irregular circumference, and a length, comprising, in combination: a first paper exterior layer having an interior face having an interior susceptor region having first and second ends and first and second edges, with the distance between the first and second ends being at least equal to the article length and with the distance between the first and second edges sufficient to enclose the circumference of the food article, with the susceptor region including microwave interactive material throughout, with the weight of the sleeve being selected to be crimpably flexible to conform to the circumference of the article; and means for compressively contacting the susceptor region with the article and forming the susceptor region into the sleeve.

2. The sleeve of claim 1 wherein the compressively contacting means is devoid of microwave interactive material.

3. The sleeve of claim 2 wherein the compressively contacting means comprises, in combination: first strips fabricated from the first paper layer extending from the first and second edges and between the first and second ends of the susceptor region; second strips fabricated from the first paper layer extending from the first strips opposite to the susceptor region and between the first and second ends of the susceptor region; and means for securing the second strips together to form the sleeve having a circumference greater than the circumference of the article to allow insertion of the article therein, with the first and second strips forming a fin which can be drawn tightly against the article to produce the compressive contact between the susceptor region and the article.

4. The sleeve of claim 3 wherein the second strip securing means comprises hot-melt adhesive.

5. The sleeve of claim 4 additionally comprising, in combination: a second paper interior layer integrally

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laminated to and overlaying entirely the first paper layer.

6. The sleeve of claim 3 wherein the compressively contacting means further comprises, in combination: means for adhering the first strips together after the article has been inserted in the sleeve.

7. The sleeve of claim 6 wherein the second strip securing means comprises hot-melt adhesive and the first strip securing means comprises cold cohesive.

8. The sleeve of claim 1 wherein the compressively contacting means comprises, in combination: first and second marginal portions extending from the first and second edges of the susceptor region; and means for adhering the marginal portions together.

9. The sleeve of claim 8 wherein the adhering means comprises cohesive material.

10. The sleeve of claim 9 wherein the cohesive material is applied in a strip and wherein the sleeve additionally comprises, in combination: a second paper interior layer integrally laminated to and overlaying entirely the first paper layer.

11. The sleeve of claim 8 wherein the compressively contacting means further comprises, in combination: a fin extending from the first marginal portion opposite to the susceptor region.

12. The sleeve of claim 1 wherein the compressively contacting means includes a fin which extends tangentially from the susceptor region when the susceptor region compressively contacts the article.

13. The sleeve of claim 12 wherein the fin underlies the article during heating in the microwave.

14. The sleeve of claim 13 additionally comprising, in combination: a second paper interior layer integrally laminated to and overlaying entirely the first paper layer.

15. The article of any preceding claim additionally comprising a fresh, baked food article compressively disposed within the sleeve and having the susceptor region in a close proximal relation to a substantial portion of the exterior surface of the article.

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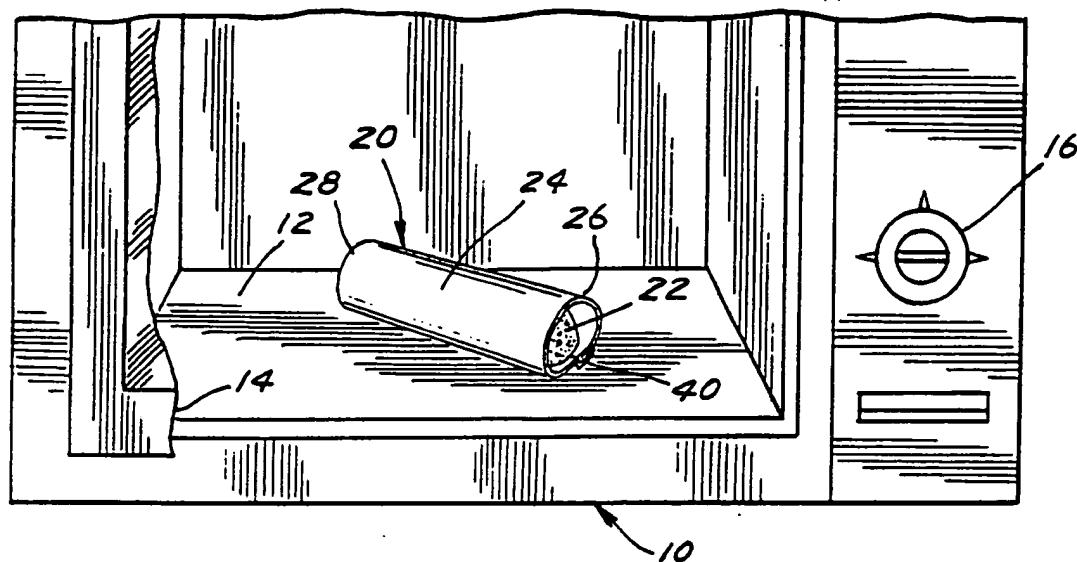


FIG. 2

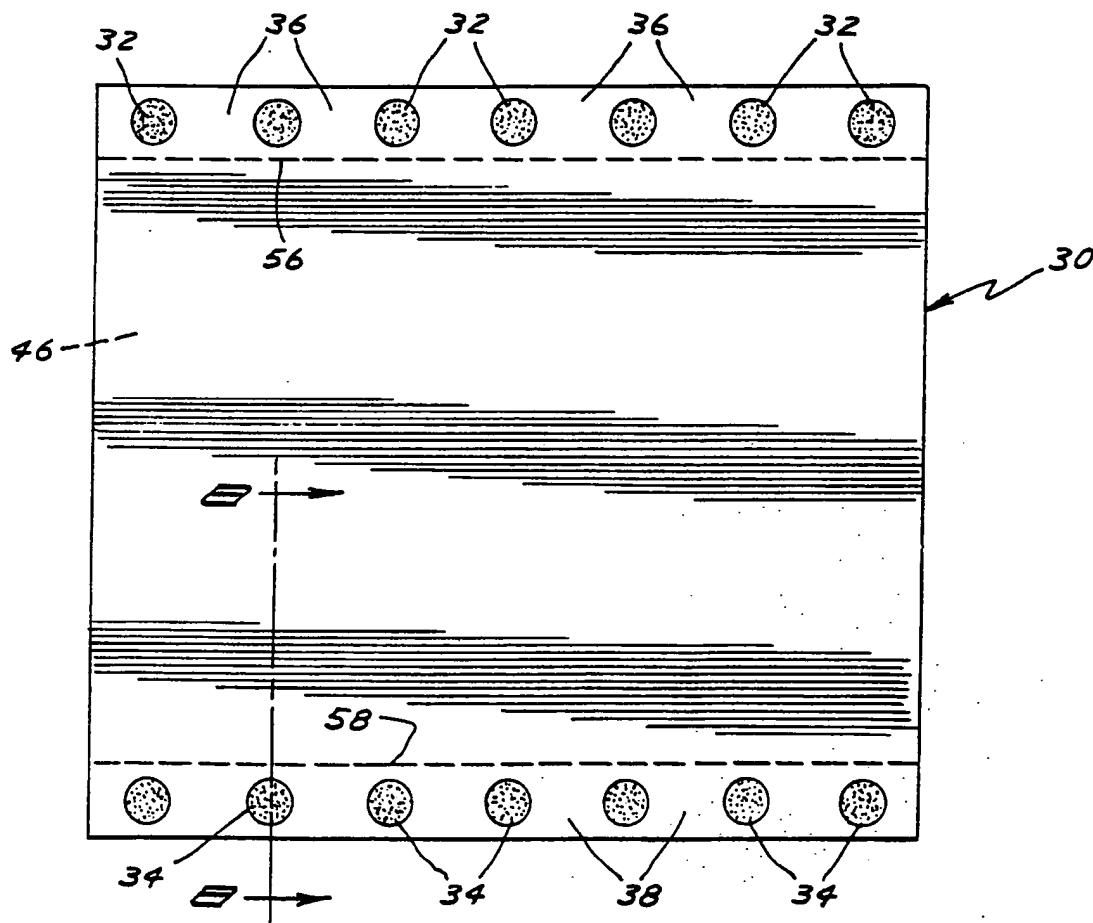


FIG. 2

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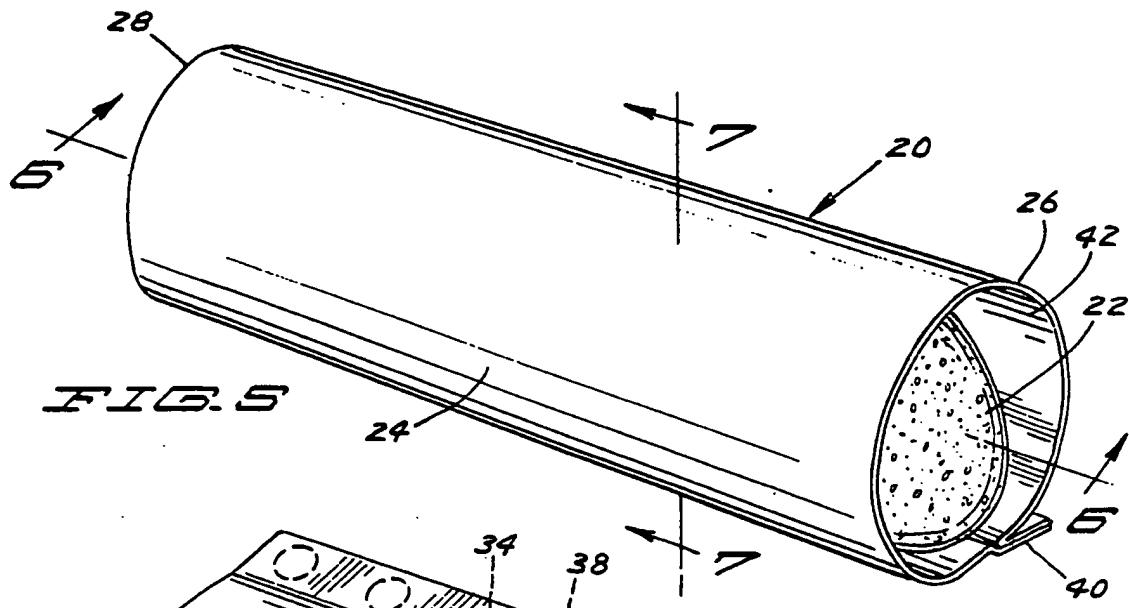


FIG. 4

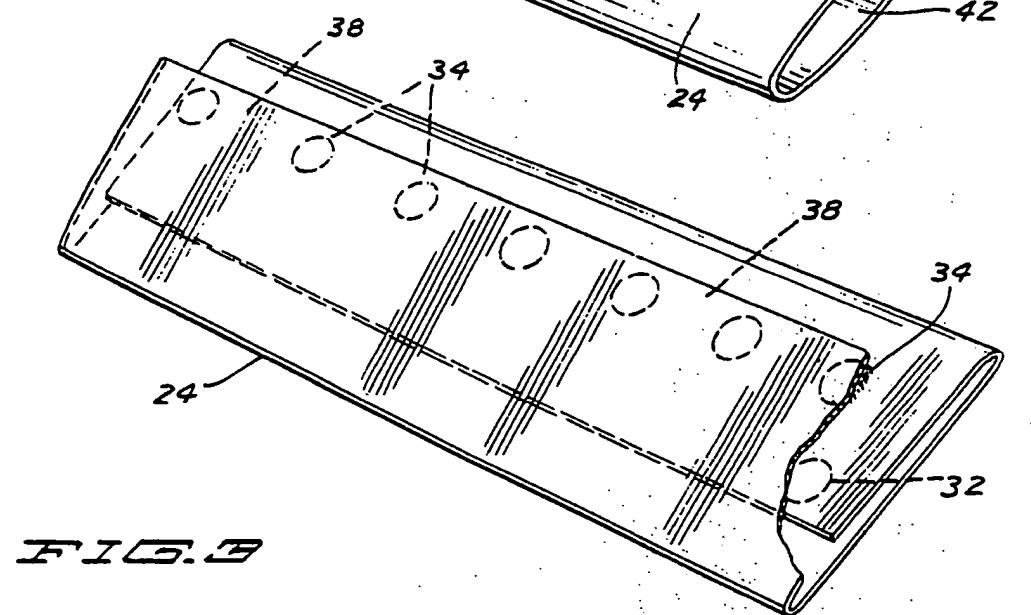
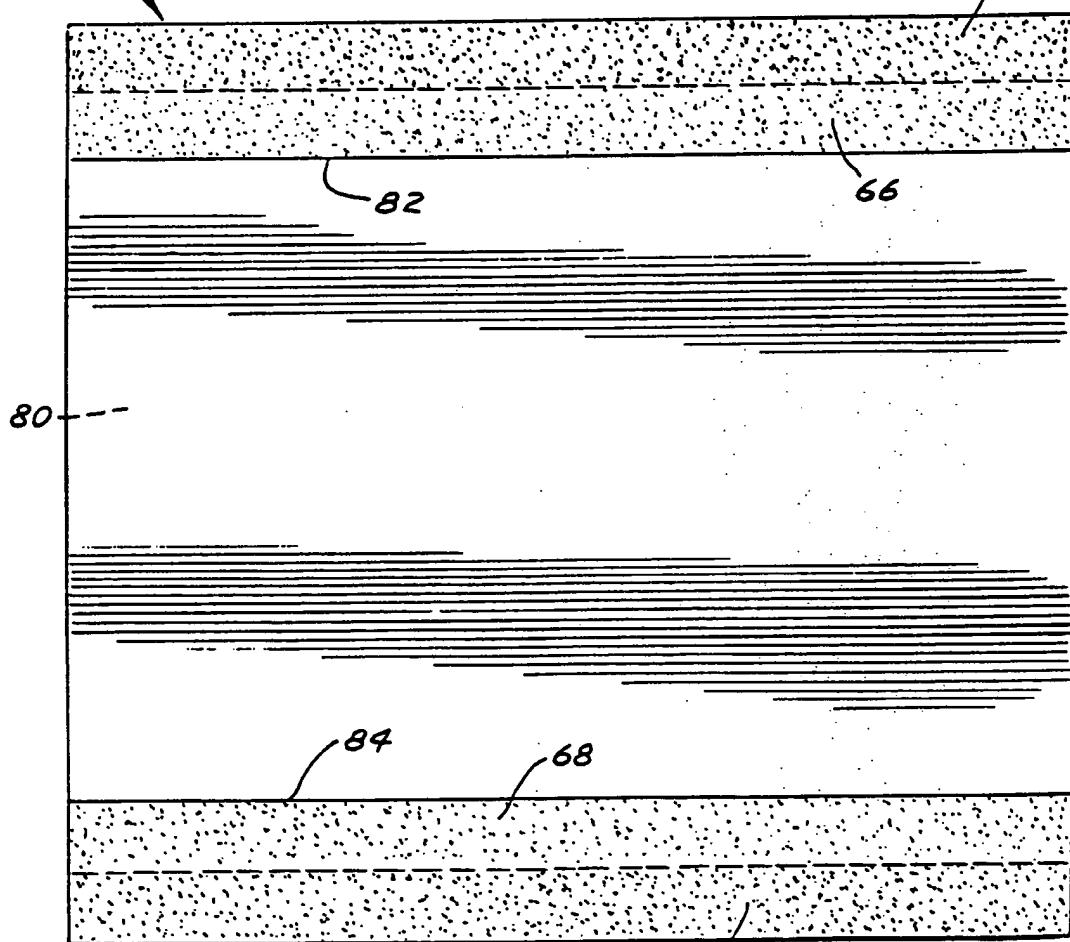
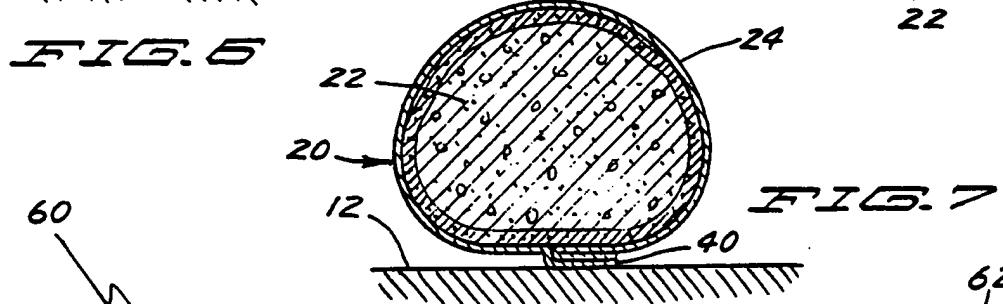
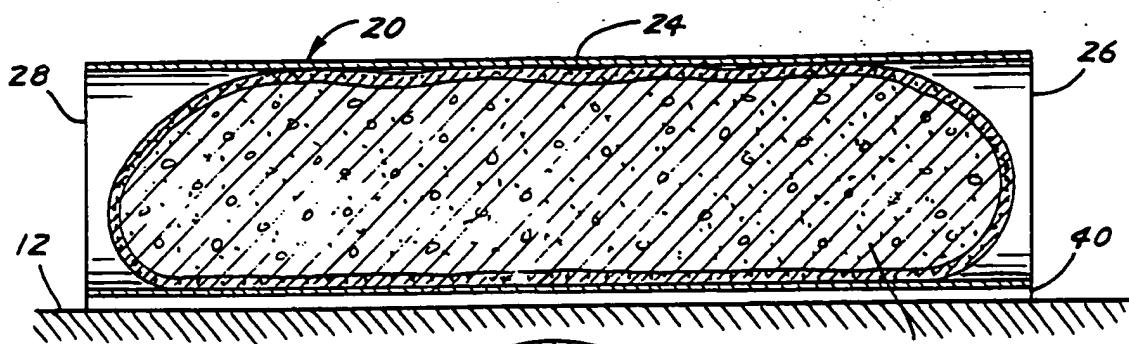


FIG. 3

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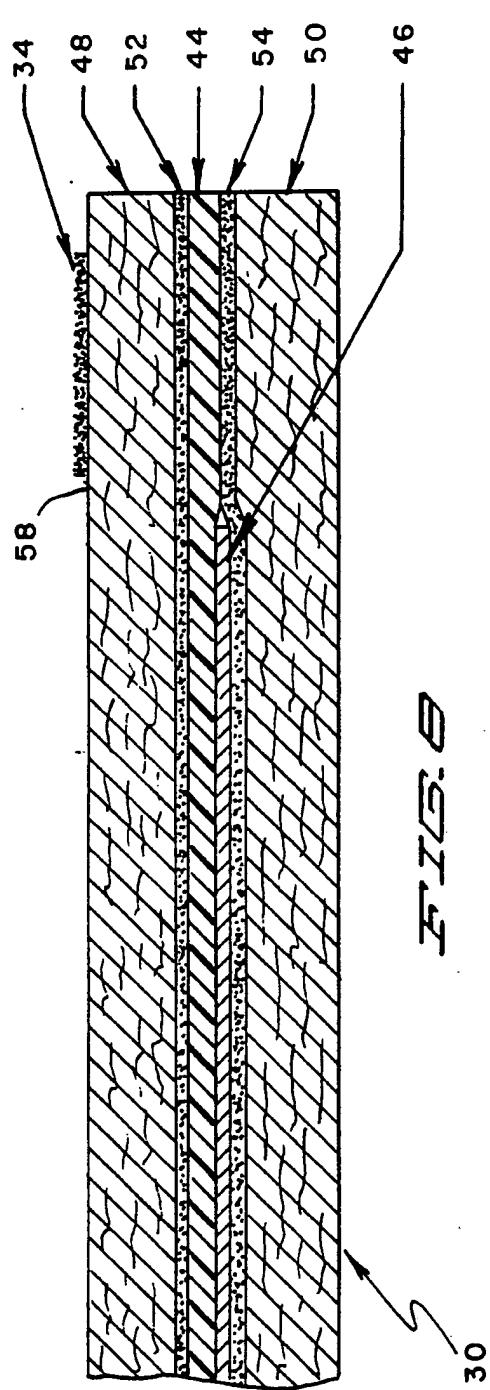


FIG. 6

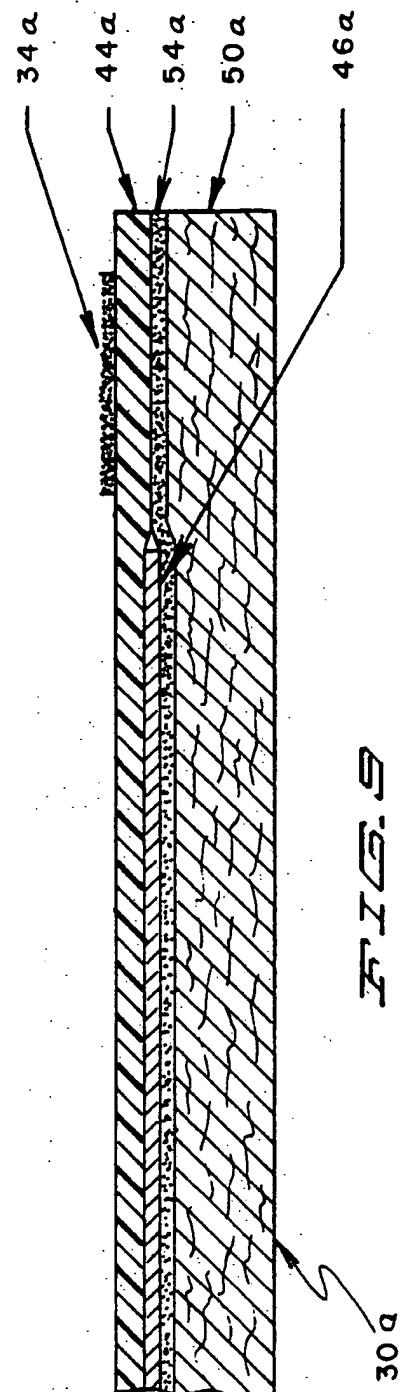
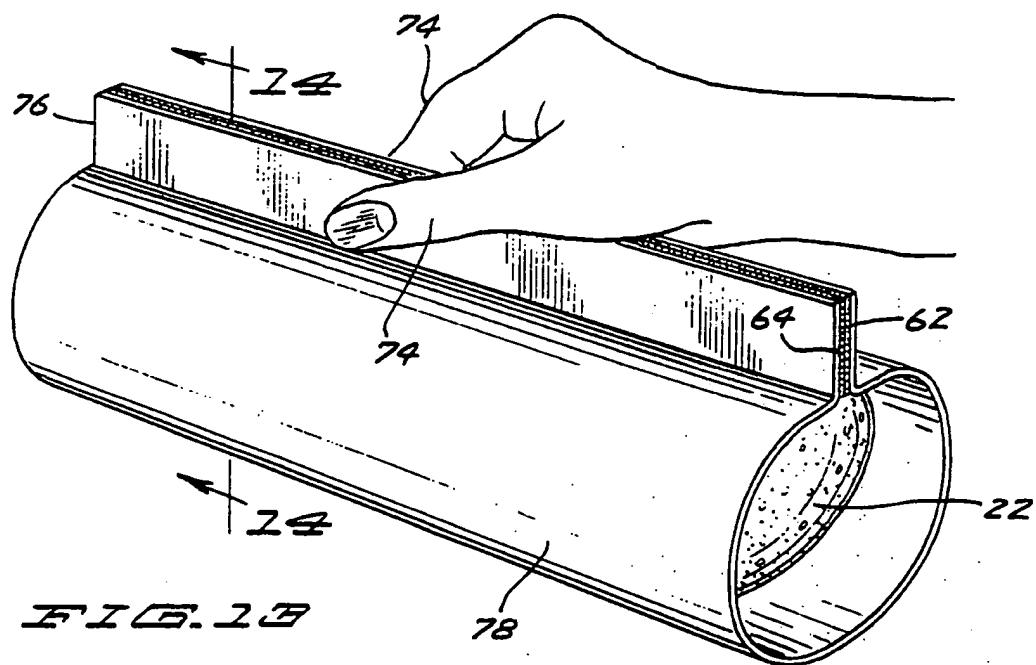
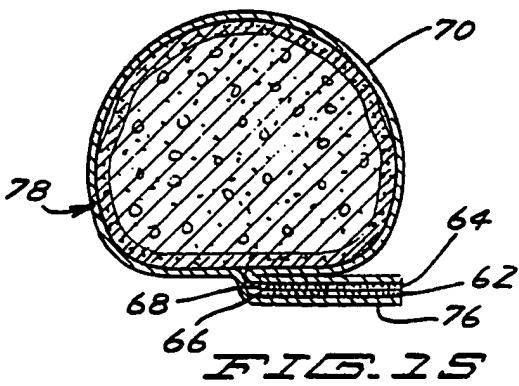
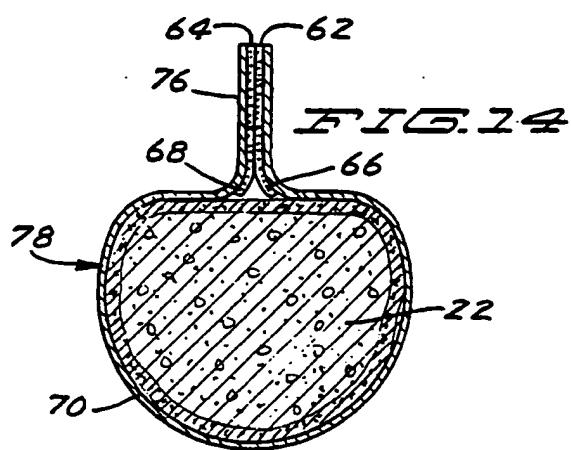
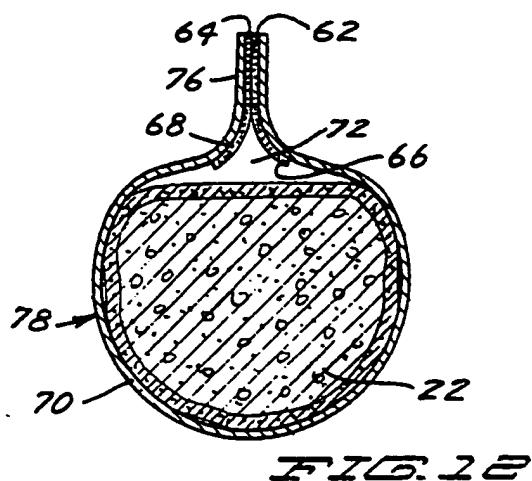
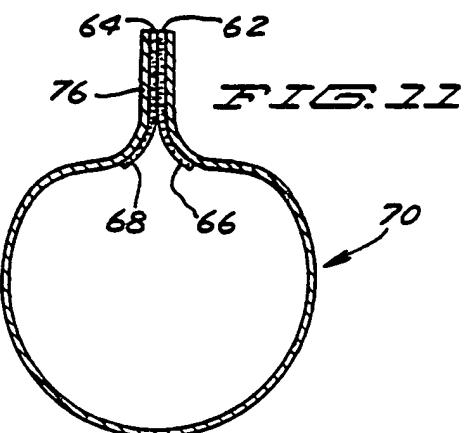
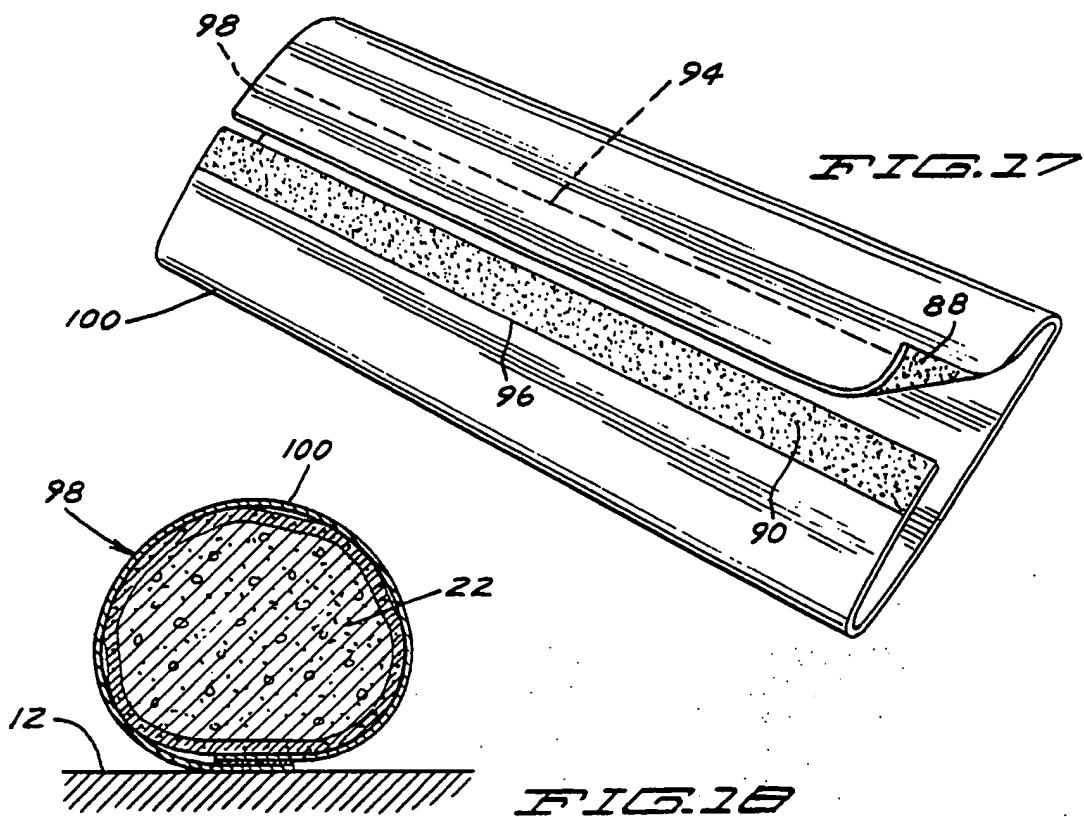
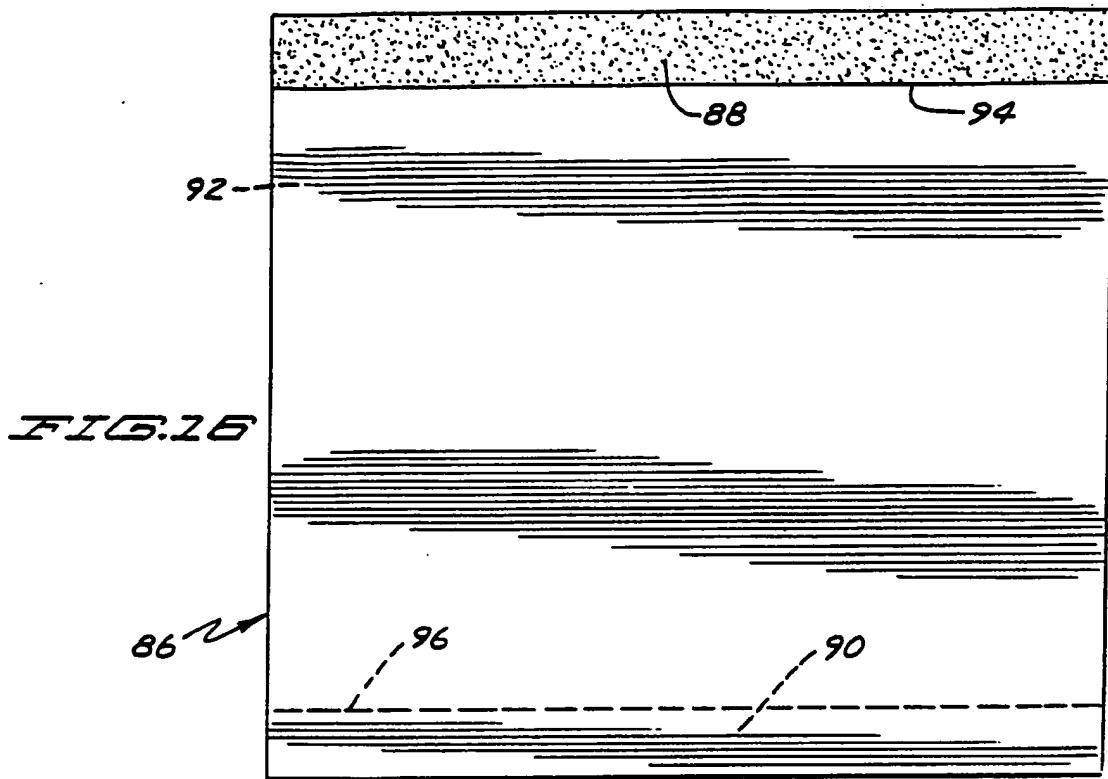


FIG. 5

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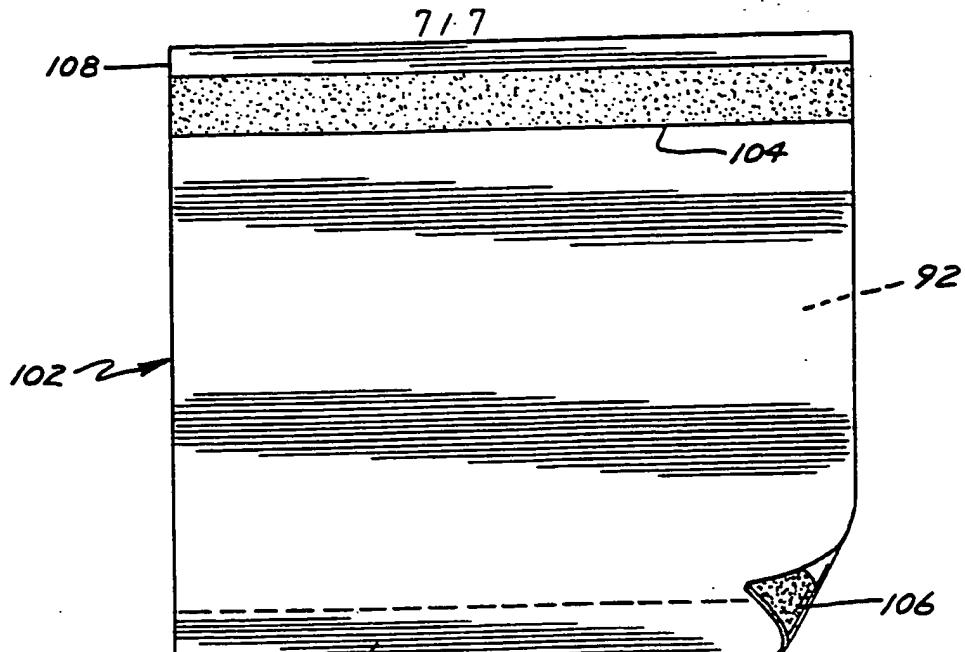


FIG. 19

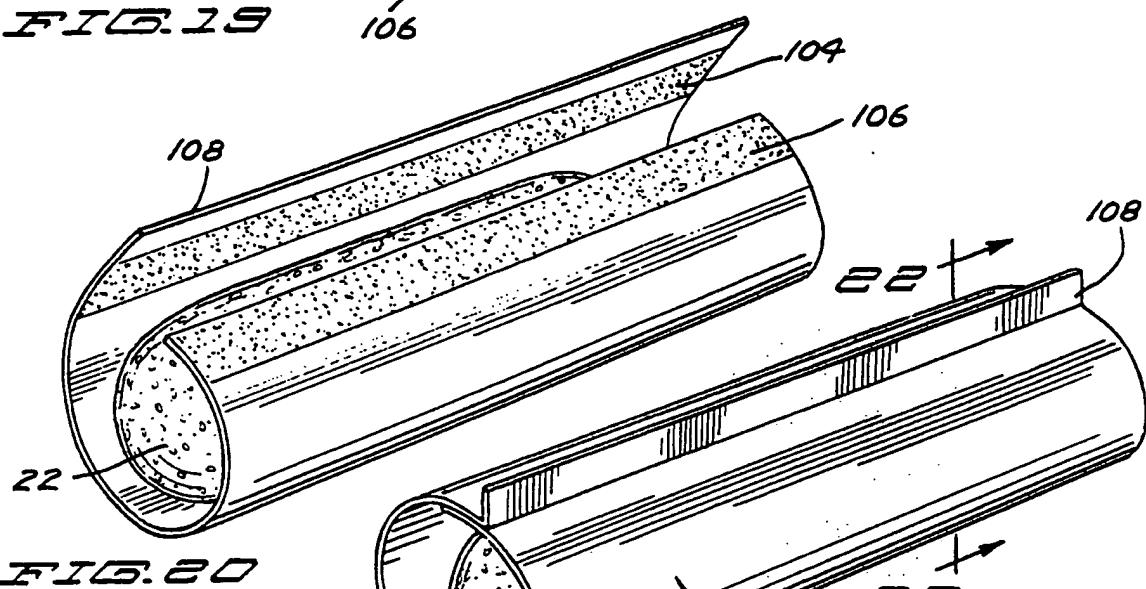


FIG. 20

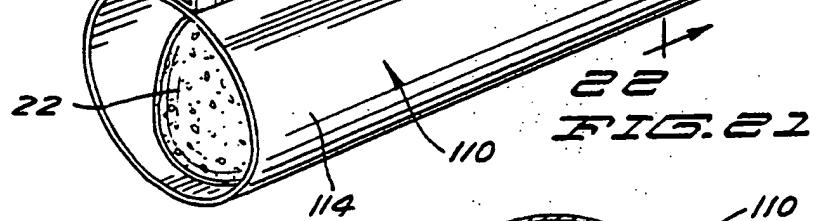


FIG. 21



FIG. 22

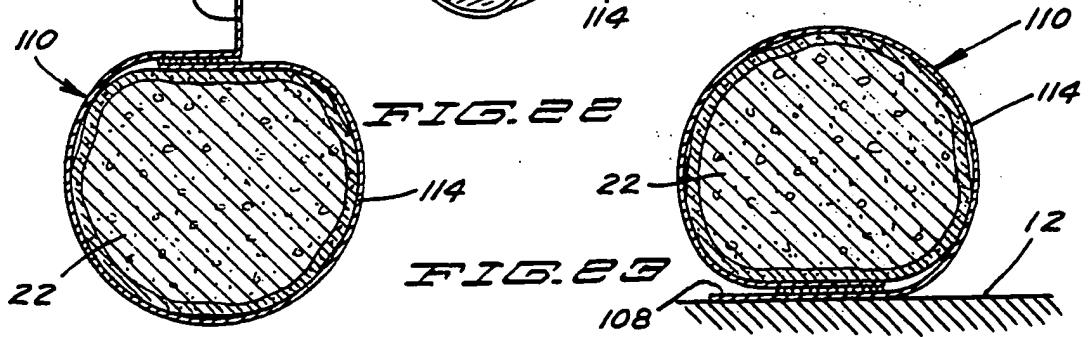


FIG. 23

INTERNATIONAL SEARCH REPORT

PCT/US 90/06867

International Application No.

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)⁶

According to International Patent Classification (IPC) or to both National Classification and IPC.

Int.Cl. 5 H05B6/64

II. FIELDS SEARCHED

Minimum Documentation Searched⁷

Classification System	Classification Symbols
Int.Cl. 5	H05B

Documentation Searched other than Minimum Documentation
to the Extent that such Documents are Included in the Fields Searched⁸III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹

Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	WO,A,8809754 (LEIGHMARDON PTY. LTD.) 15 December 1988 see page 4, line 16 - page 7, line 19; figures 1-3 ---	1, 8, 15
P, X	EP,A,369192 (JAMES RIVER CORP.) 23 May 1990 see column 6, line 16 - column 7, line 18 see column 7, line 50 - column 8, line 50 see column 11, lines 4 - 46; figures 1-5 ---	1-4, 8, 9, 11 15
A	US,A,4861957 (T.W. WELLES) 29 August 1989 ---	
A	US,A,4780587 (R.K. BROWN) 25 October 1988 ---	

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"V" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search

25 MARCH 1991

Date of Mailing of this International Search Report

- 6. 05. 91

International Searching Authority

EUROPEAN PATENT OFFICE

Signature of Authorized Officer

ALBERTSSON E.G.

ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO. PCT/US 90/06867

SA 42547

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on
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25/03/91

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
WO-A-8809754	15-12-88	AU-B-	597840	07-06-90
		AU-A-	1944988	04-01-89
EP-A-369192	23-05-90	US-A-	4890439	02-01-90
		JP-A-	2249635	05-10-90
US-A-4861957	29-08-89	None		
US-A-4780587	25-10-88	None		

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